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WARNING

Because of possible shock or fire hazards, connection of this instrument should be performed in compliance with the National Electrical Code (ANSI C1) and/or any other requirements which may be applicable to the user.

Installation, operation, and maintenance should be performed only by qualified personnel.

TM-106705U

VOLUME 1

OPERATOR'S MANUAL

626-PA-6001

SINGLE PHASE AC MONITOR

NOTE: Refer to Volume 2 (Service Manual) of TM-106705U for maintenance data.

15 March 1983
(Rev. 1 November 1983)

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DRANETZ

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626-PA-6001 SINGLE PHASE AC MONITOR

1 INTRODUCTION

This manual provides instructions for the 626-PA-6001 Plug-in, hereinafter referred to as the 6001. The 6001 is designed for installation in the Model 626 Universal Disturbance Analyzer. It is assumed that the reader is familiar with the mainframe information described in TM-106650U.

2 PURPOSE

The 6001 is designed to monitor single phase AC power lines. With thresholds programmed by the user, the 6001 monitors both short and long term power line disturbances. With this plug-in, the unit stores, analyzes, classifies and prints out quantative and qualitative disturbance data. Accompanying the data is a printout of time derived from a highly accurate crystal-controlled 24-hour clock in the mainframe.

The plug-in monitors any single phase power line whose RMS values range from a low value of 20 volts to as high as 600 volts, programmable in three broad ranges. Three types of disturbances are monitored by the 6001: power line frequency, power frequency transients and waveform disturbances. Power frequency transients are divided into five display categories: overvoltage, undervoltage, voltage change, voltage surge and voltage sag. Waveform disturbances, identified as "impulses," include all conditions that cause the power line waveform to deviate from an ideal waveform. The 6001 measures both the peak amplitude of impulses and their polarity. When equipped with an option board, the 6001 also measures pulse duration and directivity. The threshold value of each type of disturbance, as well as the line frequency, above which detection and printout occurs, is operator programmable. Except for an automatic summary printout at the end of each day, disturbance data is normally printed out only when the disturbances occur. In an alternate mode, a disturbance data summary printout occurs only at the end of each day. This feature permits long term unattended operation.

The threshold program may be easily altered, using the front panel switches. Cueing indicators adjacent to the programming switches simplify the programming procedure. A back-up program for the plug-in, stored in hard memory at the factory, may always be recalled upon operator demand. Both the program and the disturbance data in the data accumulators may be printed out upon demand.

3 APPLICATIONS

When installed in the 626 mainframe, the 6001 provides the capability of monitoring and evaluating power system performance. Among its typical applications are the following:

a. To determine the effect of power systems operation on equipment malfunction. The time-referenced power fault disturbance record produced by the instrument permits rapid correlation of errors, outages, and equipment damage in computer, industrial process controls, digital communications equipment, medical monitoring apparatus, and so forth, to power line faults.

b. To perform pre-installation site surveys. The 6001 can be used to determine the adequacy of exisiting power lines intended to support critical electrical equipment. Anticipation of power problems saves time, money, and future trouble.

c. For diagnostic evaluation of power system performance. The portable instrument, particularly well suited for field use, is ideal for determining the probable causes of, and remedies for, power line disturbances.

d. For monitoring life test racks. The printout produced by the instrument provides a clear record of the quality of power supplied during unattended periods.

4 EQUIPMENT CHARACTERISTICS

The 6001 is configured as a plug-in module 6.5" high by 1.25" wide x 10" deep. It is designed for installation in any one of the five slots of the Model 626 Universal Disturbance Analyzer. Technical specifications of the 6001 are presented in Table 1.

Table 1. 626-PA-6001 Technical Specifications

Input	2 wire differential Z_{in} = 40 Megohms plus 40 pf (each side to ground)
Full Scale Input Voltage Ranges	200V F.S. 400V F.S. 600V F.S.
Input Voltage Frequency	45 - 65 Hz
Overall Input Voltage Ranges	20 - 200 VAC 40 - 400 VAC 80 - 600 VAC

Table 1. 626-PA-6001 Technical Specifications (Cont'd.)

Lower Limit of (1V Inc.'s) User-Set Voltage	200V F.S. Range	20 - 199 VAC
	400V F.S. Range	40 - 398 VAC
	600V F.S. Range	80 - 596 VAC
Upper Limit of User-set Voltage	200V F.S. Range	21 - 200 VAC
	400V F.S. Range	42 - 400 VAC
	600V F.S. Range	84 - 600 VAC
Voltage Change Sensitivity (1V Increments)		
200V F.S. Range		1 - 15 volts
400V F.S. Range		2 - 30 volts
600V F.S. Range		4 - 60 volts
Line Voltage Measurement Accuracy		±1% of reading, ±0.2% of full scale at calibration frequency of 50 or 60 Hz. Additional ±1% at frqequency extremes.
Line Voltage Measurement Resolution		
200V F.S. Range		0.2 Vrms
400V F.S. Range		0.4 Vrms
600V F.S. Range		0.8 Vrms
Impulse Ranges (2 mSec to 1 uSec)		
200V F.S. Range		25 - 1000V
400V F.S. Range		50 - 2000V
600V F.S. Range		100- 4000V
Impulse Thresholds (1V Increments)		
200V F.S. Range		25 - 1000V
400V F.S. Range		50 - 2000V
600V F.S. Range		100- 4000V
Impulse Accuracy		±5% of reading ±1% F.S. for half-sinewave impulses 10 uSec in duration regardless of polarity or grounding. Error increases to ±10% of reading, ±1% F.S. at 5 uSec and 50 uSec pulse durations, and is -6 dB typ. at 2 mSec and 1 uSec pulse widths
Line Frequency		
Range		45 - 65 Hz
Resolution		±0.1 Hz
Accuracy		±0.2 Hz
Program Limits		.2 Hz to 3.0 Hz (.1 Hz Increments)

5 INSTALLATION

To install the 6001 in the mainframe, proceed as follows:

CAUTION: Be sure unit is turned off and that all power connected to all the plug-in modules is turned off.

a. Position the top and bottom rear corners of the plug-in module in the upper and lower tracks at the desired slot positon at the rear of the mainframe.

b. Carefully slide the module into the mainframe until it is firmly seated.

c. Tighten the top and bottom captive screws to secure the module to the mainframe.

6 CONNECTING POWER SOURCE TO MODULE

The 6001 is supplied with either a barrier type terminal strip under a small cover or with an AC connector located at the rear of the module. Proceed as follows:

a. Insert key in FUNCTION key switch on front panel of mainframe and set switch to OFF position.

b. Turn off AC power to the line that is to be monitored.

c. If a terminal strip is mounted on the rear panel of the 6001, remove the terminal strip safety cover to expose the connections. Now connect the single phase line to the three terminals (two AC leads to upper two terminals and earth ground to the third terminal, as marked). When all connections have been made, be sure to replace the terminal block cover, then reapply AC power.

d. If a connector is installed on the rear panel of the 6001, the AC source to be monitored should be wired to the cable assembly supplied with the module. If the supplied cable is not adequate the mating connector can be obtained from AMP, Inc. The part numbers are as follows:

Part Number	Description
1-480700-0	Connector Housing
1-640720-0	Strain Relief
350689-1	Socket Contacts

Attach wired mating connector to the rear panel connector then reapply AC power.

WARNING

Because of possible shock or fire hazards, connection of this instrument should be performed in compliance with the National Electrical Code (ANSI C1) and/or any other requirements which may be applicable to the user.

Installation, operation, and maintenance should be performed only by qualified personnel.

CAUTION

To avoid damaging the equipment, do not apply AC voltages in excess of 600V RMS to the 6001.

7 OPERATING THE 6001

7.1 Operating Controls and Indicators

The functions of the mainframe operating controls and indicators associated with 6001 operation are described in Table 2. Figure 1 show the typical front panel controls on a Model 626. For a description of controls common to overall Model 626 operation, refer to TM-106650U.

7.2 Selecting the Voltage Range

One of three ranges may be selected which effectively defines the maximum or full scale input voltage. For example, for a RANGE F.S. of 200V, the low limit value may range from 1-199 VAC; the upper limit may range from 21-200 VAC.

Table 2. 6001 Operating Controls

Item	Function
RANGE pushbutton and lamp	When lamp lights, user is cued to depress RANGE pushbutton and enter RANGE F.S. value via the numeric keyboard. Printer will prompt values to choose from.
LO LIMIT pushbutton	When depressed,enables numeric keyboard to program low limit voltage
HI LIMIT pushbutton	When depressed, enables numeric keyboard to program high limit voltag
SENS pushbutton	When depressed, enables numeric keyboard to program voltage sensitivity value.

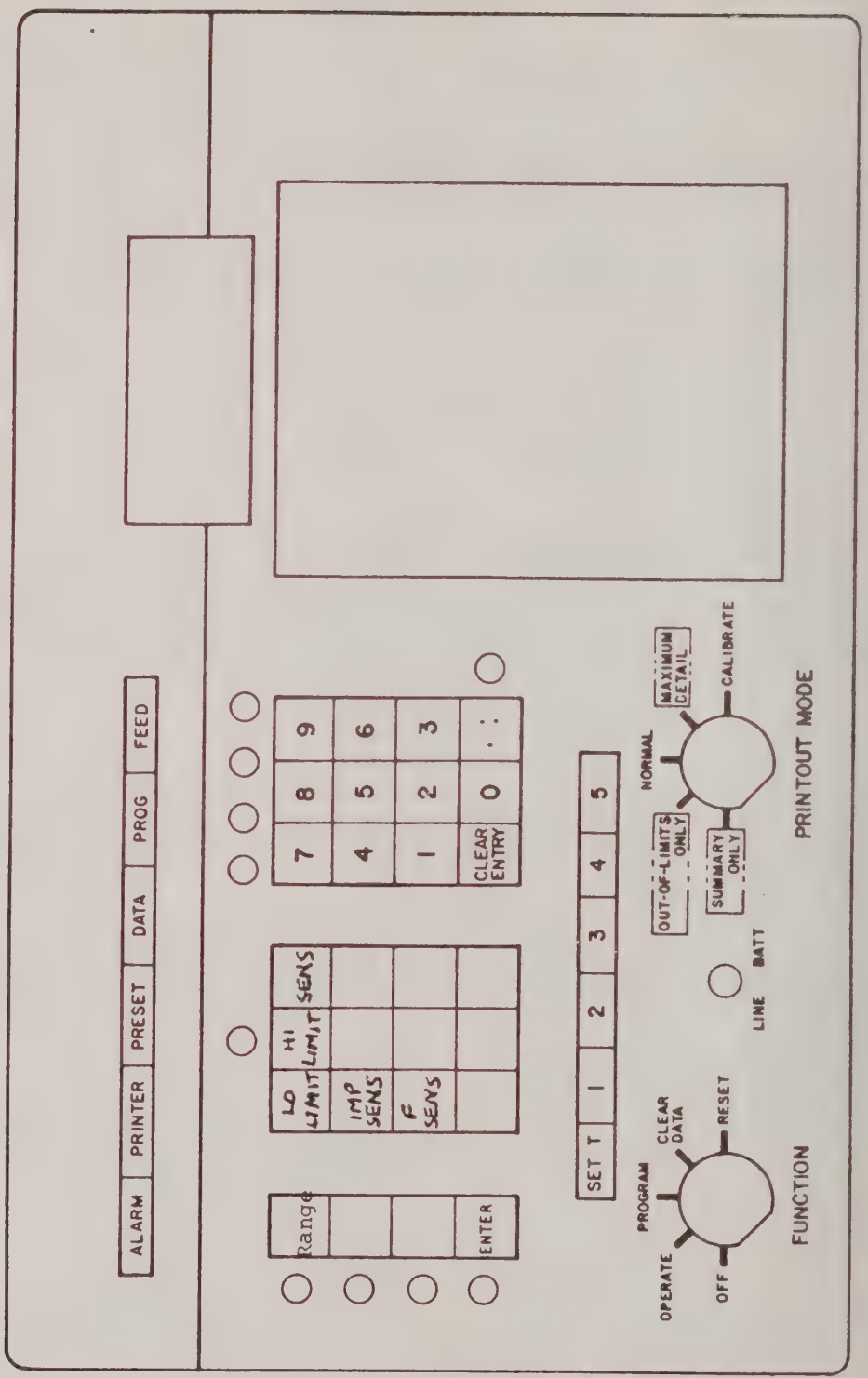
ALARM
PRINTER
PRESET
DATA
PROG
FEED
Range
ENTER
LO LIMIT
HI LIMIT
SENS
IMP SENS
F SENS
7
8
9
4
5
6
1
2
3
CLEAR ENTRY
0
. :
SET T
1
2
3
4
5
PROGRAM
OPERATE
CLEAR DATA
RESET
OFF
FUNCTION
LINE
BATT
OUT-OF-LIMITS ONLY
NORMAL
MAXIMUM DETAIL
SUMMARY ONLY
CALIBRATE
PRINTOUT MODE

Table 2. 6001 Operating Controls (Cont'd)

IMP SENS pushbutton	When depressed, enables numeric keyboard to program impulse voltage sensitivity value.
F SENS pushbutton	When depressed, enables numeric keyboard to program frequency sensitivity value.
ENTER pushbutton	When depressed, transfers numeric keyboard value into the 6001 memory.
DATA pushbutton	When depressed, produces data summary printout.
PRESET pushbutton	With FUNCTION switch set to PROGRAM and a channel switch (1-5) depressed, depressing PRESET switch recalls non-volatile factory program for that channel. Only valid when range lamp is lit.

7.3 Programming Procedure

Assume it is desired to program a full scale range of 200V, a high limit of 125V, a low limit of 105V, voltage sensitivity of 2 volts, frequency sensitivity of 0.5 Hz and an impulse sensitivity of 100V. Sensitivity sets the deviation from the present value above or below which a detected value produces a recorded disturbance. This is true for both voltage and frequency.

For impulse measurements, the sensitivity corresponds to the absolute threshold, so that for an impulse sensitivity of 100 volts, a disturbance is recorded when impulse amplitude rises above 100 volts.

For the example cited, program the 6001 as follows:

a. Set FUNCTION switch to PROGRAM.

b. Depress the channel pushbutton (1-5) that corresponds to the slot position of the plug-in to be programmed. Note that a program summary for that channel is immediately printed.

c. Note that the lamp next to the RANGE pushbutton lights. Depress the RANGE pushbutton. The printer prompts:

Enter one of three ranges: 200, 400, or 600V F.S.

d. Note that three lamps above the numeric keyboard now light. Enter 200, using the keyboard. This selects the first range (20-200 VAC) of the plug-in. As each digit is entered, one lamp goes out. If an error is made, depress CLEAR ENTRY and correct the entry.

e. When the RANGE value has been programmed, the lamp next to the ENTER pushbutton lights. Depress this pushbutton to enter the value. The RANGE entry (RANGE F.S. 200V) will now be echoed back on the printout.

f. When the ENTER indicator goes out, one indicator above the center bank of pushbuttons lights. This indicates that another function may be programmed.

g. Depress the HI LIMIT pushbutton. Program the high limit value (125) as in step d.

h. When the ENTER indicator lights, depress the ENTER pushbutton. The programmed high limit value will be echoed back on the printout.

i. Repeat steps f, g and h for the low limit voltage (105V) using the LO LIMIT pushbutton.

j. Repeat steps f, g and h for the voltage sensitivity, using the SENS pushbutton and programming the voltage value as 02.

k. Repeat steps f, g, and h for the frequency sensitivity (0.5Hz), using the F SENS pushbutton and programming the value as 0.5.

l. Repeat steps f, g, and h for the impulse sensitivity (0100 volts), using the IMP SENS pushbutton. The completed program printout should take the following form:

```
IMPULSE SENS   0100V
FREQ SENS      0.5HZ        ↑
VOLTAGE SENS    002V        | (Read Up)
V LOW LIMIT    105 V
V HIGH LIMIT   125 V
RANGE F.S.     200V
```

NOTE

The instrument is designed to detect an invalid entry and to automatically shift high and low limits if range is changed without reprogramming the limits. If the RANGE value is selected as 200V and the user selects 205V as the low limit value, the printout ENTRY TOO HIGH will appear.

m. When the plug-in program is completed, the user may proceed to program another module (by depressing another channel number) or he may place the instrument on line by setting the FUNCTION switch to OPERATE. While on line, the program in effect may be obtained by simply depressing the PROG pushbutton.

8 SELECTING THE FACTORY PRESET PROGRAM

To select the program stored in hard memory, set the FUNCTION switch to PROGRAM and depress the channel number desired. The last operator-set program will be printed out. Now depress the PRESET pushbutton to recall the factory-set program. An example of this sequence appears below.

```
                IMPULSE SENS  Ø1ØØV
                FREQ SENS    ØØ.5Hz
                VOLTAGE SENS  ØØ2V
                V LOW LIMIT   1Ø5 V
                V HIGH LIMIT  125 V
                RANGE F.S.    2ØØV            (Factory Program)
                    626-PA-6ØØ1
                        CH 1
                PROGRAM SUMMARY
(Read Up)                                     (Press PRESET)
                IMPULSE SENS  ØØ25V
                FREQ SENS     Ø2.ØHZ
                VOLTAGE SENS   ØØ2 V          (Operator Program)
                V LOW LIMIT    1ØØ V
                V HIGH LIMIT   13Ø V
                RANGE F.S.     2ØØV
                    626-PA-6ØØ1
                PROGRAM SUMMARY
```

9 DESCRIPTION OF DATA PRINTOUTS

When any of the disturbances described below is detected by the 6ØØ1, it is recorded and displayed in characteristic manner.

9.1 Overvoltage

An overvoltage condition exists when the monitored power line voltage exceeds the user-specified upper limit for more than 2.55 seconds. The beginning of an overvoltage condition is indicated by a printout such as the following:

```
4   HIGH   12:34:56.78
```

where 4 is the channel number and time is given in hours, minutes and seconds (to .Ø1 sec resolution).

When the line voltage recovers to normal, a printout such as the following occurs:

```
4   NORM   12:36:14.56
    135.8  V  MAX
```

indicating when normal voltage was restored and the value of the highest voltage reached during the overvoltage interval.

9.2 Undervoltage

An undervoltage condition exists when the monitored power line voltage remains below the user-specified lower limit for more than 2.55 seconds. The beginning of an undervoltage condition is indicated by a printout such as the following:

```
4   LOW    10:09:12.34
```

When the line voltage returns to normal level, a message such as the following is printed:

```
4   NORM   10:09:12.34
    96.4   V   MIN
```

indicating when normal voltage was restored and the value of the lowest voltage reached during the undervoltage interval.

9.3 Voltage Change

A voltage change printout is triggered when the line voltage changes more than a preselected amount from the last printed value. The voltage change sensitivity is a user-selected integral voltage between one and 15 volts for a 115-volt line. The following example shows several voltage change printouts:

Printout	Remarks
2 INC 01:02:34.56 115.4 V	Voltage increased to 115.4V at time shown
2 DEC 01:02:34.56 109.2 V	Voltage decreased to 109.2V at time shown

9.4 Voltage Surge

A Voltage Surge is defined as a line voltage which increases through a user-selected upper limit and then returns to an in-tolerance condition in less than 2.56 seconds. When a surge begins, its starting time is printed as follows:

```
3   HIGH   12:34:50.49
```

When the line voltage returns to a normal level following a Surge condition, a message such as the following will be printed:

```
3   NORM   12:34:51.59
    139.2  V  MAX
    SURGE 1.10 SEC
```

In this case, the time at which the voltage returns to normal is shown as well as the maximum voltage reached and the surge duration.

9.5 Voltage Sag

A Voltage Sag is defined as a line voltage that decreases below the user-selected lower limit and then returns to an in-tolerance condition in less than 2.56 seconds. Sag printouts take the same form as surge printouts, with the term SAG replacing the term SURGE, and the term MIN replacing the term MAX.

NOTE

Voltage inputs less than 25V RMS will be printed out as Ø.ØV on the 6ØØ1.

9.6 Impulses

"Impulse" disturbances represent any line perturbation which contains frequency components in the 3ØØ Hz to 5ØØ kHz range. An impulse type disturbance produces a printout such as the following:

```
2   IMP     1Ø:12:13.45
    +Ø139   V   PK
```

This printout indicates that an impulse which deviated from normal line voltage by +139 volts peak was detected on channel 2 at the time shown.

1Ø PRINTOUT MODES

The setting of the PRINTOUT MODE switch on the front panel of the mainframe determines how much detail is printed out. Printout data is reduced as the switch is rotated counterclockwise.

The following example printouts show how various settings of the PRINTOUT MODE switch change the amount of detail in the printed record of a disturbance. It is assumed that the disturbances occurred in Channel 1 and that the limits for Channel 1 were programmed as follows:

RANGE F.S.	2ØØ Vrms
V LOW LIMIT	1Ø5 Vrms
V HIGH LIMIT	125 Vrms
V SENSITIVITY	2 Vrms

The example printouts are referenced to figures 2 and 3 which illustra overvoltage and voltage sag disturbances, respectively.

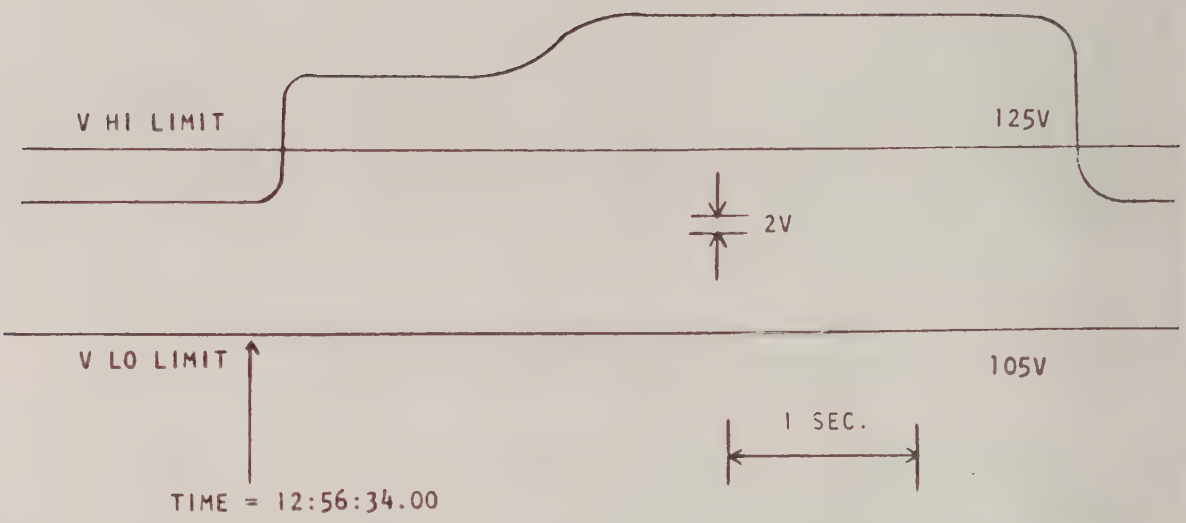

Figure 2. Overvoltage Disturbance (6001)

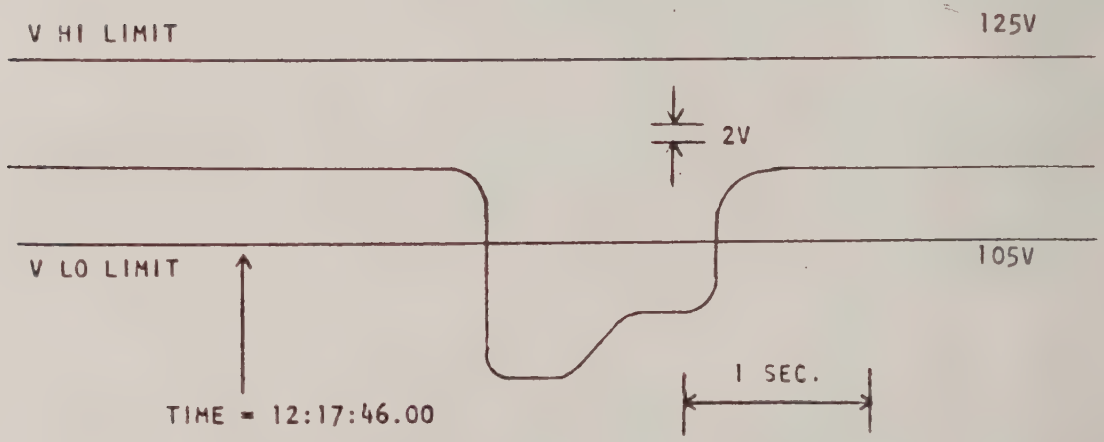

Figure 3. Voltage Sag Disturbance (6001)

Disturbances which occur while the PRINTOUT MODE switch is in the SUMMARY ONLY position do not generate individual printouts but they are stored in the daily accumulator and are automatically printed each day at midnight (worst case event and number of occurrences in each category). This printout may also be triggered manually by depressing the DATA button.

```
1  NORM  12:56:38.51
   139.1  V  MAX

1  HIGH  12:56:34.21
```

Printout of overvoltage (fig. 2) in OUT-OF-LIMITS ONLY mode

```
1  NORM  12:56:38.51
   139.1  V  MAX

1  DEC  12:56:38.50
   130.2  V

1  INC  12:56:35.78
   137.3  V

1  INC  12:56:35.62
   135.3  V

1  INC  12:56:35.40
   133.3  V

1  INC  12:56:34.22
   131.3  V

1  INC  12:56:34.21
   129.2  V

1  HIGH  12:56:34.21
```

(Read Up) ↑

Printout of overvoltage (fig. 2) in NORMAL mode

```
1  DEC    12:56:38.61
   119.8   V

1  DEC    12:56:38.53
   121.8   V

1  DEC    12:56:38.51
   124.0   V

1  NORM   12::56:38.51
   139.1   V  MAX

1  DEC    12:56:38.50
   130.2   V

1  INC    12:56:35.78
   137.3   V

1  INC    12:56:35.62
   135.3   V

1  INC    12:56:35.40
   133.3   V

1  INC    12:56:34.22
   131.3   V

1  INC    12:56:34.21
   129.2   V

1  HIGH   12:56:34.21

1  INC    12:56:34.20
   121.1   V

1  INC    12:50:12.34
   119.0   V
```

(Read Up) ↑

Printout of overvoltage (fig. 2) in MAXIMUM DETAIL mode

```
1  NOR    12:17:48.61
   Ø9Ø.1   V  MIN
   SAG   1.25 SEC

1  LOW    12:17:47.36
```

Printout of voltage sag (fig. 3) in OUT-OF-LIMITS ONLY mode

```
1  NORM   12:17:48.61
   Ø9Ø.1   V  MIN
   SAG   1.25 SEC

1  INC    12:17:48.6Ø
   1Ø3.1   V

1  INC   12:17:48.55
   Ø98.Ø   V

1  INC    12:17:48.Ø5
   Ø96.Ø   V

1  INC    12:17:47.96
   Ø94.Ø   V

1  DEC    12:17:47.39
   Ø91.9   V

1  DEC    12:17:47.37
   Ø94.1   V

1  DEC    12:17:47.36
   1Ø1.3   V

1  LOW    12:17:47.36
```

(Read Up)

Printout of voltage sag (fig. 3) in NORMAL mode

```
1  INC    12:27:48.86
   112.1   V

1  INC    12:17:48.69
   110.0   V

1  INC    12:17:48.62
   108.1   V

1  INC    12:17:48.61
   105.9   V

1  NORM   12:17:48.61
   090.1   V  MIN
   SAG  1.25 SEC

1  INC    12:17:48.60
   103.1   V

1  INC    12:17:48.55
   098.0   V

1  INC    12:17:48.05
   096.0   V

1  INC    12:17:47.96
   094.0   V

1  DEC    12:17:47.39
   091.9   V

1  DEC    12:17:47.37
   094.1   V

1  DEC    12:17:47.36
   101.3   V

1  LOW    12:17:47.36

1  DEC    12:17:47.35
   110.8   V

1  INC    12:16:32.15
   113.0   V
```

(Read Up) ↑

Printout of voltage sag (fig. 3) in MAXIMUM DETAIL mode

10.1 System Check

When the PRINTOUT MODE switch is set to CALIBRATE, a source of precise signals is applied to the front end circuitry of the 6001. Any inputs that are connected at this time will be automatically disconnected for the system check period. These signals fully verify the operational integrity of the module. The signals and the allowable tolerance levels are described below.

10.2 System Check Signals

Impulse:	+160V pk
Voltage:	120.0 Vrms
Frequency:	
626-PA-6001 -1,2	60 Hz
626-PA-6001 -3,4	50 Hz

10.3 System Check Tolerances

F.S. RANGE	IMPULSE	VOLTAGE	FREQUENCY
200	+134 to +186 Vpk	118.4 to 121.6V	48.8 to 50.2 Hz 59.8 to 60.2 Hz
400	+124 to +196 Vpk	118.0 to 122.0V	49.8 to 50.2 Hz 59.8 to 60.2 Hz
600	+114 to +206 Vpk	117.6 to 122.4V	49.8 to 50.2 Hz 59.8 to 60.2 Hz

11 626 Module Capacity

The 626 standard mainframe has an upper limit of the total load rating of the installed modules. The overall mainframe capacity is set at 20 units, and individual modules have load ratings as follows:

Plug-in	Load Rating
626-PA-6001	2 Units
626-PA-6001 with Extra Option Board	3 Units
626-PA-6002	2 Units
626-PA-6003	4 Units
626-PA-6006	2 Units
626-PA-6006 with Extra Option Board	3 Units
626-PA-6007	1 Unit
626-PA-6008	2 Units
626-PA-6009	4 Units
626-PA-6011	1 Unit
626-PA-6012	3 Units
626-PA-6014	1 Unit

When selecting modules for installation in any mainframe, simply verify that the sum of the load ratings of the installed modules does not exceed 20.

12 STANDARD ACCESSORIES

Model No.	Part No.	Quantity	Description
626PA-6001-1 (-3)	TM-106705U Vol 1	1	Operator's Manual
626PA-6001-2 (-4)	TM-106705U Vol 1	1	Operator's Manual
	110480-G1	1	AC Cable with tinned leads

Plug-in Configurations

626-PA-6001-1	60 Hz calibration with barrier strip inputs
626-PA-6001-2	60 Hz calibration with connector inputs
626-PA-6001-3	50 Hz calibration with barrier strip inputs
626-PA-6001-4	50 Hz calibration with connector inputs

13 FACTORY REPAIR

When factory repair is desired, proceed as follows:

1. Contact the Dranetz Technologies Customer Service Department and obtain an Authorization Number.

2. Fill out the Repair/Service Order enclosed in this manual and ship it with the equipment to the Customer Service Department.

CUSTOMER SERVICE DEPT.
DRANETZ TECHNOLOGIES, INC.
1000 NEW DURHAM ROAD, CN-91
EDISON, NEW JERSEY 08818

REPAIR/SERVICE ORDER

TEL: (201) 287-2535
(201) 287-3680
TWX: (710) 997-9553
CABLE: DRANETZ

NOTE: THIS COMPLETED FORM MUST ACCOMPANY RETURNED EQUIPMENT

CUSTOMER SHIPPING & BILLING INFORMATION

CUSTOMER P. O. # _____ P. O. DATE _____

SHIP TO: _____ INVOICE TO: _____

In Continental U. S., material will be returned by Dranetz to you by UPS, UPS Blue or other carrier chosen by Dranetz unless otherwise designated.

EQUIPMENT BEING RETURNED

Date of Original Purchase: _____ Original P. O. # _____

Model No. _____ S/N _____

Model No. _____ S/N _____

Ancillary equipment also being returned (If you neglect this, these items may not be returned to you).

☐ Power & Other Cables _____ ☐ Instr. Book _____

☐ Plug-ins (incl. S/N) _____ ☐ Connectors _____

☐ Other _____

RETURN AUTHORIZATION

Have you discussed the problem with Dranetz Sales or Service personnel?

Dranetz Return Authorization # _____

By: _____

If so, with whom _____ Date: _____

Whom should the Dranetz Customer Service Dept. contact for technical questions?

_____ ( )

NAME (Print) DEPARTMENT TELEPHONE

DESCRIPTION OF PROBLEM

Please be detailed, explicit and complete. Include test data, if this helps to describe the problem.
IMPORTANT: Repairs cannot be made unless this section is completely filled out.
(Attach added sheets if necessary)

CHECK WHERE APPLICABLE: IS MALFUNCTION RELATED TO: Warmup ☐ Temperature ☐
Intermittency ☐ Mechanical Handling ☐ Visual Defects ☐ Grounding ☐ Test Data Attached ☐

INITIATOR OF THIS ORDER

NAME/TITLE SIGNATURE TELEPHONE

(SEE OTHER SIDE FOR INSTRUCTIONS)

IMPORTANT (ENCLOSE THIS ENTIRE FORM WITH EQUIPMENT)

INSTRUCTIONS FOR REPAIR ORDER - DRANETZ TECHNOLOGIES

IMPORTANT: FOLLOW INSTRUCTIONS & USE THIS FORM. IT IS DESIGNED TO HELP US HELP YO

1. Before returning equipment to our factory, call our Customer Service Department, Tel:(201) 287-25 Give the model No., serial number, and information on the problem.

   A. Our specialists may be able to solve your problem rapidly without equipment return.

   B. If equipment return is needed, you will be supplied with appropriate instructions and authorizati information to expedite service.

2. If return is to be made,

   A. Fill out the other side of this form COMPLETELY.

   B. Enclose original of form INSIDE the shipping carton, preferably attached by masking tape to t equipment.

   C. Ship prepaid (including insurance); we will return prepaid unless otherwise advised by you.

   D. IMPORTANT - PACK PROPERLY! SHIPPING DAMAGE WILL BE CHARGED TO YOU!

NOTE:

Statement of Warranty - All products of Dranetz Technologies, Inc. are warranted to the original purchaser against defective material and workmanship for a period of one year from the date of delivery. Dranetz will repair or replace, at its option, all defective equipment returned, freight prepaid, during the warranty period, without charge for repair, provided there is no evidence that the equipment has been mishandled or abused.

FILL OUT OPPOSITE SIDE OF THIS FORM AND RETURN WITH EQUIPMENT.

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